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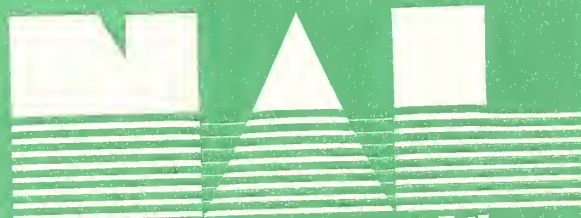
# Information Resources for Livestock and Poultry Handling and Transport

1990 – 1998

*AWIC Resource Series No. 4*

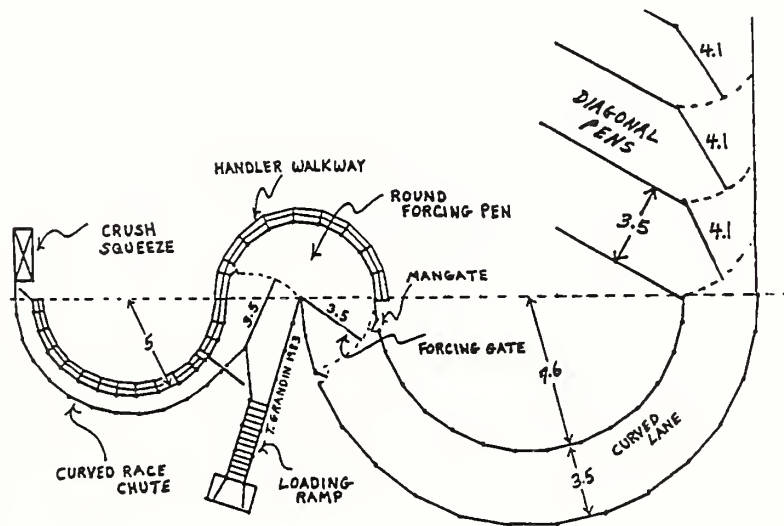


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# Information Resources for Livestock and Poultry Handling and Transport 1990 – 1998 *December 1998*



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Thanks are also due to David Farr and D'Anna Jensen for invaluable computer assistance.

# Introduction

*Information Resources for Livestock and Poultry Handling and Transport* was developed by the Animal Welfare Information Center (AWIC) of the U.S. Department of Agriculture (USDA), National Agricultural Library (NAL), in an effort to provide a current guide to the scholarly information available on the handling and transport of farm animals.

Techniques used to move livestock, whether on the home farm, up the loading ramp of a long-distance transport truck, or down a raceway at the packing plant, have tended to be more a matter of habit and tradition than a subject for scientific investigation. In recent years, however, the prime importance of efficient and humane handling practices has become more widely recognized. Researchers in the fields of animal science and applied ethology have built up a substantial body of knowledge in this area, with one general conclusion — proper handling is essential on both economic and animal welfare grounds.

This guide provides an entrance into that body of knowledge, which includes scientific journals, books, newsletters, conference proceedings, videotapes, the Internet, governmental and institutional guidelines, and the expertise of individuals and organizations.

The staff of the Animal Welfare Information Center hope that you find this publication to be a useful addition to your farm animal resources and welcome any comments for future editions.

# **How to Use This Document**

This publication is divided into seven sections: a full-text article bibliographies preceded by a full-text article, audiovisuals, internet resources, organizations, guidelines, subject index, and document delivery information for U.S. and foreign patrons.

## **Bibliography**

This section is preceded by an article written by an recognized authority in the field of livestock handling. Following the article is a comprehensive bibliography containing citations that are arranged alphabetically according to the last name of the primary author. The reference section of the article may or may not overlap with the bibliographies. Each bibliographic entry contains the NAL call number if the particular source is available at the National Agricultural Library.

## **Audiovisuals**

Livestock handling is a subject for which visual demonstration can be particularly useful. This annotated section describes the many videos and slide sets available pertaining to this topic. Most of the videos are in the NAL collection.

## **Internet Resources**

This section cites currently available websites containing information pertinent to livestock handling and transport. The section is divided into two parts: webpages of individual and organizations, and full-text on-line documents and pamphlets.

## **Organizations**

A number of organizations have shown an interest in livestock transport and handling issues. Information on how to contact each organization via a variety of

electronic means and/or postal address is provided, as well as a brief description of the resources and services each offers.

## Guidelines

This section cites some of the regulations and guidelines covering the handling and transport of livestock written by national and regional governments and non-profit and industry groups. It is not a comprehensive list.

## Subject Index

The index for this publication was generated primarily from the titles of bibliographic entries. In some instances, index words were taken from the descriptors or other information accompanying the entry. The number of each index term corresponds to the *page number* on which the index term can be found.

## Document Delivery Information

The information contained here provides directions on how to obtain copies of articles mentioned in the bibliography. There are separate directions for U.S. patrons and those readers outside the United States. **All patrons are encouraged to use their local resources before contacting the National Agricultural Library.** While the National Agricultural Library provides a variety of services to patrons around the world, videocassettes are not available for loan outside the United States and Canada.

# Assessment of Stress During Handling and Transport<sup>1,2</sup>

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**ABSTRACT:** Fear is a very strong stressor, and the highly variable results of handling and transportation studies are likely to be due to different levels of psychological stress. Psychological stress is fear stress. Some examples are restraint, contact with people, or exposure to novelty. In many different animals, stimulation of the amygdala with an implanted electrode triggers a complex pattern of behavior and autonomic responses that resemble fear in humans. Both previous experience and genetic factors affecting temperament will interact in complex ways to determine how fearful an animal may become when it is

handled or transported. Cattle trained and habituated to a squeeze chute may have baseline cortisol levels and be behaviorally calm, whereas extensively reared animals may have elevated cortisol levels in the same squeeze chute. The squeeze chute is perceived as neutral and non-threatening to one animal; to another animal, the novelty of it may trigger intense fear. Novelty is a strong stressor when an animal is suddenly confronted with it. To accurately assess an animal's reaction, a combination of behavioral and physiological measurements will provide the best overall measurement of animal discomfort.

Key Words: Handling, Restraint, Welfare, Anxiety, Stress, Slaughter

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## Introduction

Studies to determine the amount of stress on farm animals during routine handling and transport often have highly variable results and are difficult to interpret from an animal welfare standpoint. This paper will cover some of the factors that influence how an animal may react during handling. Much of the variability between handling studies is likely to be due to different levels of psychological stress. Animals can be stressed by either psychological stress (restraint, handling, or novelty) or physical stresses (hunger, thirst, fatigue, injury, or thermal extremes). Procedures such as restraint in a squeeze chute do not usually cause significant pain, but fear may be a major psychological stressor in extensively raised cattle. Many apparently conflicting results of different studies may be explained if the varying amounts of psychological stress and physical stress within each study are considered. Fear responses in a particular situation are difficult to predict because they depend on how the animal perceives the handling or transport experience. The animal's reactions will be governed by

a complex interaction of genetic factors and previous experiences. For example, animals with previous experiences with rough handling will remember it and may become more stressed when handled in the future than animals that have had previous experiences with gentle handling. Previous handling experiences may interact with genetic factors. Rough handling may be more detrimental and stressful to animals with an excitable temperament compared to animals with a more placid temperament. For example, Brahman-cross cattle had higher cortisol levels when restrained in a squeeze chute than English crosses (Zavy et al., 1992). An animal's social rank within the group can also affect stress levels. McGlone et al. (1993) found that subordinate submissive pigs were more stressed by 4 h of transport than dominant pigs. This paper will only address short-term stressors such as handling and transport. The measurement of chronic stress imposed by the environment or different housing systems is much more complex.

## Importance of Fear and Effects of Novelty

Fear is a universal emotion in the animal kingdom and motivates animals to avoid predators. All vertebrates can be fear-conditioned (LeDoux, 1994). The amygdala in the brain is probably the central fear system that is involved in both fear behavior and the acquisition of conditioned fear (Davis, 1992). Davis

<sup>1</sup>Presented at a symposium titled "Effects of Stress in Farm Animals" at the ASAS 87th Annu. Mtg., Orlando, FL, July 26, 1995

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(1992) cited over 20 animal studies from many different laboratories that showed that electrical stimulation of the amygdala with an implanted electrode triggers a complex pattern of behaviors and changes in autonomic responses that resembles fear in humans. In humans, electrical stimulation of the amygdala elicits feelings of fear (Gloor et al., 1981). Studies have also shown that electrical stimulation of the amygdala will increase plasma corticosterone in cats (Setckleiv et al., 1961; Matheson et al., 1971) and in rats (Redgate and Fahringer, 1973). Lesioning of the amygdala will block both unconditioned and conditioned fear responses (Davis, 1992). Large lesions in the amygdala will reduce emotionality in wild rats as measured by flight distance (Kemble et al., 1984). Kemble et al. (1984) also noted that lesioning of the amygdala had a taming effect on wild rats. LeDoux (1994) explains that fear conditioning takes place in a subcortical pathway and that extinguishing a conditioned fear response is difficult because it requires the animal to suppress the fear memory via an active learning process. A single, very aversive event can produce a strong conditioned fear response, but extinguishing this fear response is much more difficult.

Observations by the author on cattle ranches have shown that to prevent cattle and sheep from becoming averse and fearful of a new squeeze chute or corral system, painful or highly aversive procedures should be avoided the first time the animals enter the facility. The same principle also applies to rats. Rats that receive a strong electrical shock the first time they enter a novel alley will refuse to enter it again (Miller, 1960). However, if the rat is subjected to a series of shocks of gradually increasing intensity, it will continue to enter the alley to get a food reward. Therefore, Hutson (1993) recommends that stress in sheep during routine handling could be reduced if the animals were conditioned gradually to handling procedures. Less severe procedures should be done first (Stephens and Toner, 1975; Dantzer and Mormede, 1983).

Novelty is a very strong stressor (Stephens and Toner, 1975; Moberg and Wood, 1982; Dantzer and Mormede, 1983). This is especially true when an animal is suddenly confronted with it. In the wild, novelty and strange sights or sounds are often a sign of danger (Grandin, 1993a). Cattle will balk at shadows or differences in flooring during movement through handling facilities (Grandin, 1980). Pigs that have been trained to laboratory procedures will respond to deviations in their daily routine with a rise in blood pressure (Miller and Twohill, 1983). Reid and Mills (1962) have suggested that livestock can be trained to accept changes in management routines that would cause a significant increase in physiological measurements in animals that had not been trained. Gradual exposure of animals to novel experiences enables them to become accustomed to

nonpainful stimuli that had previously evoked a flight reaction. Grandin et al. (1995b) reported that training nyala antelope to cooperate during blood sampling had to be done very slowly to avoid triggering a massive flight reaction. The animals are very vigilant and will react to any unfamiliar sights and sounds.

There are some situations in which novelty is attractive to animals. Cattle and pigs often approach and manipulate a piece of paper dropped on the ground. The author has observed that the same piece of paper will cause animals to balk and jump away if they are being forced to walk toward it. Therefore, the paper may be perceived as threatening in one situation and non-threatening in another. The author has observed that cattle in the Philippines seldom react to cars, trucks, and other distractions when they graze on the highway median strip. Cars and trucks are no longer novel because they have seen them since birth. In the nyala antelope, animals born after the adults had been trained to blood sampling procedures learned to cooperate more quickly (Grandin et al., 1995b).

Cattle can become accustomed to repeated non-aversive procedures such as weighing or drawing blood through an indwelling catheter (Peischel et al., 1980; Alam and Dobson, 1986). Sheep, pigs, and giraffes have been trained to voluntarily enter a restraint device (Panepinto, 1983; Wienker, 1986; Grandin, 1989).

However, animals do not habituate to procedures that are very aversive (Hargreaves and Hutson, 1990a). A procedure can be highly aversive without being painful. Full inversion to an upside-down position is extremely aversive to sheep. The time required to drive sheep down a race into a restraint device that inverted them increased the following year (Hutson, 1985). Cortisol levels did not decrease with experience when cattle were subjected to repeated truck trips during which they fell down (Fell and Shutt, 1986). Hargreaves and Hutson (1990a) found that repeated trials of a sham shearing procedure failed to reduce the stress response. Sheep also did not habituate to 6 h of restraint with their legs tied (Coppinger et al., 1991).

Apple et al. (1995) found that in sheep, 6 h of restraint stress caused dark cutting meat and very high ( $> 110$  ng/mL) levels of cortisol. Epidural blockage with lidocaine, which prevents the animals from contracting their muscles and straining against the restraint, failed to inhibit glycogen metabolism. This experiment indicates that psychological stress was probably a significant factor.

Cattle are very sensitive to the relative aversiveness of different parts of handling procedures. When they were handled every 30 d in a squeeze chute and a single animal scale, balking at the scale decreased with successive experience and balking at the squeeze chute increased slightly (Grandin, 1992). The animals learned that the scale never caused discomfort. Cattle that had been mishandled in a squeeze

chute and struck hard on the head by the headgate were more likely to resist entry into the chute in the future (Grandin et al., 1994) compared with cattle that had never been hit with the headgate.

### Effects of Adaptation to Handling on Stress

Tame animals that are accustomed to frequent handling and close contact with people are usually less stressed by restraint and handling than animals that seldom see people. Binstead (1977), Fordyce et al. (1985), and Fordyce (1987) report that training weanling heifer calves produced calmer adult animals that were easier to handle. Training these extensively raised calves involved walking quietly among them, teaching them to follow a lead horseman and quiet walking through chutes. How an animal is handled early in life will have an effect on its physiological response to stressors later in life. Calves on a university experiment station that had become accustomed to petting by visitors had lower cortisol levels after restraint than calves that had less frequent contact with people (Boandle et al., 1989). Lay et al. (1992a) found that restraint in a squeeze chute was almost as stressful as hot-iron branding for extensively reared beef cattle. In hand-reared dairy cows, branding was much more stressful than restraint (Lay et al., 1992b).

Taming may reduce the physiological reactivity of the nervous system. Hastings et al. (1992) found that hand-reared deer had lower cortisol levels after restraint compared with free-ranging deer. Even though the physiological response to restraint was lower in the tame animals, hand-reared deer struggled just as violently as free-range deer (Hastings et al., 1992). Associations that animals make seem to be highly specific. Mateo et al. (1991) found that tame sheep approached a person more quickly, but behavioral measurements of struggling indicated that taming did not generalize to other procedures. Similar findings by Hargreaves and Hutson (1990a,b) showed that gentling and reduction of the sheep's flight zone failed to reduce aversion to shearing. Tame animals can sometimes have an extreme flight reaction when suddenly confronted with novelty that is perceived as a threat. Reports from ranchers and horse trainers indicate that horses and cattle that are calm and easy to handle at their home farm sometimes become extremely agitated when confronted with the novelty of a livestock show or auction. The animal's behavioral reaction seems to be less likely to generalize to other procedures than its physiological reaction. Moberg and Wood (1982) found that experiences during rearing greatly affected behavior in an open field test but had little effect on adrenocortical response of lambs. Exposing piglets to novel noises for 20 min increases both heart rate and motor activity. Heart rate

habituated to a recording of abattoir sounds more quickly than motor activity (Spensley et al., 1995).

The effects of previous experience on an animal's fear response may provide one explanation for the often variable results in handling and transport studies. For example, extensively raised animals may have more psychological or fear stress during loading and unloading for transport compared to more intensively reared animals. British researchers have found that loading and unloading of sheep and calves was the most stressful part of the journey (Trunkfield and Broom, 1990; Knowles, 1995). Kenney and Tarrant (1987) reported that for Irish cattle, the actual journey was more stressful than loading and unloading. The physical stresses of the trip, such as jiggling, were more stressful than the psychological stresses of loading or unloading. A possible explanation for this discrepancy between these two studies may be the amount of contact the animals had with people. There may be a big difference in the degree of fear stress between U.S. cattle reared on rangeland where they seldom see people and European pasture-reared cattle. Differences in the degree of psychological stress may explain why too many rest stops during long-distance transport is detrimental to the health of weaner calves raised under U.S. conditions. Cattle feeders have learned from practical experience that 200- to 300-kg calves shipped from the southeast to Texas will have fewer health problems if they are transported non-stop for the entire 32-hour trip. For these extensively reared calves, rest stops may possibly turn into stress stops. Research is needed to conclusively determine what factors cause the rest stops to be stressful. Legislating too many rest stops may be detrimental to welfare. One possibility is fear stress during loading and unloading at rest stops and the second possibility is that the calves become infected with diseases at the rest stop. Many of the calves shipped on these trips are not properly vaccinated. There may be an interaction between rest stops and disease. Frequent rest stops may be more beneficial to fully vaccinated calves.

### Genetics

Genetic factors such as temperament interact in complex ways with an animal's previous handling experiences and learning to determine how it will react during a particular handling procedure. Wild species are usually more reactive to novel stimuli than domesticated animals. Price (1984) maintains that the domestic phenotype have reduced responses to changes in the environment. Domesticated animals are more stress-resistant because they have been selected for a calm attitude toward people (Parsons, 1988). When deer or antelope are tamed, the flighty temperament is masked until they are confronted with a novel stimulus that is perceived as threatening. A



tame deer or antelope can have an explosive reaction to a novel event. A wild species has a more intense flight response because this enables it to flee from predators.

Temperament in cattle is a heritable trait that may affect the animal's reaction to handling (Le Neindre et al., 1995). There are differences in temperament both between and within cattle breeds. Within the Brahman breed, temperament is heritable (Hearnshaw et al., 1979; Fordyce et al., 1988). Temperament differences between breeds have also been reported by Stricklin et al. (1980) and Tulloh (1961). Genetics also affects an animal's response to stress. Brahman-cross cattle had higher cortisol levels while restrained in a squeeze chute compared to English crosses (Zavy et al., 1992). Recent research by Grandin et al. (1995a) and replicated by H. Randle (1995, personal communication, University of Plymouth, U.K.) indicated that the spiral hair whorl on a bovine's forehead is an indicator of temperament. Cattle with spiral hair whorls above the eyes became more agitated while restrained than animals with hair whorls below the eyes.

Temperament may be under genetic control in many different animals. Research with rats has shown that they can be selected for either high or low emotionality (Fujita et al., 1994) or for reduced fear-induced aggressiveness toward humans (Popova et al., 1993). Phenotypic characteristics are also related to temperament. Interestingly, it seems that different genetic factors control fear-induced aggression and intermale aggression. Selection for reduced fear-induced aggression had no effect on aggressive behavior toward other male rats.

Temperament is a trait that seems to be stable over time. In European Continental-cross cattle, certain individuals became extremely agitated every time they were handled in a squeeze chute and others were always calm (Grandin, 1992). The agitated animals failed to adapt to being held in the squeeze chute during four handling sessions spaced 30 d apart. Cattle with a very excitable temperament may have greater difficulty adapting to repeated nonpainful handling procedures than cattle with a calmer temperament. The two types of animals may have differing physiological and behavioral reactions to the same procedure. Animals with a calm temperament may adapt more easily and become less stressed with repeated handling treatments and animals with a very excitable temperament may become increasingly stressed with each repeated handling treatment. Lanier et al. (1995) found that some pigs habituated to a swimming task and maintained near baseline levels of epinephrine and norepinephrine and other animals failed to habituate and never adapted.

At five slaughter plants in the United States, Holland, and Ireland, the author has observed increasing problems with very excitable pigs and cattle from certain genetic lines that become highly agitated. It is

almost impossible to drive them quietly through a high-speed slaughter line. These animals seem to have a much stronger startle reaction to novelty, are more likely to balk at small distractions such as shadows or reflections in the race, and are more likely to bunch together. Observations at slaughter plants and reports from ranchers also indicate that excitable cattle are more likely to injure themselves when they are confronted with the novel, unfamiliar surroundings of an auction market or slaughter plant. The appearance of greater numbers of more excitable pigs and cattle may possibly be related to the increasing emphasis of the livestock industry on lean beef and pork. In both cattle and pigs, the author has observed that excessive excitability occurs most often in animals bred for leanness that have a slender body shape and fine bones. Cattle and pigs bred for large, bulging lean muscles usually have a calmer temperament. This is an area that needs to be researched. Practical experience indicates that the excitable animal problem needs to be corrected because excessive excitability creates serious animal welfare problems during handling at auction markets and slaughter plants.

Cattle and pig producers need to select animals with a calm temperament, but care must be taken not to over-select for any one particular trait. A good example of overselection for a single trait is the halothane gene in pigs. Pigs with this gene have increased meat production, but the price for this increased production is poor meat quality (Pommier and Houde, 1993). Over-selection for calm temperament may possibly have detrimental effects on economically important traits, such as maternal ability. Researchers in Russia found that selecting foxes for calmness over 80 yr produced animals that lost their seasonal breeding pattern and had strange piebald black and white colored coats (Belyaev, 1979; Belyaev and Borodin, 1982). The foxes turned into animals that acted and looked like Border collies.

### Fear Pheromones

Another factor that could confound handling stress studies is fear pheromones. Vieville-Thomas and Signoret (1992) found that urine from a stressed gilt caused other gilts to avoid a feed dispenser and urine from an unstressed animal had no effect. Both the results of this experiment and observations by the author indicate that it takes 10 to 15 min for the fear pheromone to be secreted. Observations by the author indicate that cattle will voluntarily walk into a restraining chute that is covered with blood, but if an animal becomes extremely agitated for several minutes, the other animals refused to enter (Grandin, 1993b). In a laboratory setting pigs witnessing slaughter had no increases in either beta endorphins or cortisol. These were calm animals fitted with jugular catheters (Anil et al., 1995). Eibl-Eibesfeldt

(1970) observed that if a rat is instantly killed by a trap, the trap will remain effective and can be used again. Rats will avoid a trap that failed to instantly kill. Research with rats indicates that blood may contain a fear pheromone (Stevens and Gerzog-Thomas, 1977). Stevens and Saplikoski (1973) found that blood and muscle tissue from stressed rats was avoided in a choice test, whereas brain tissue and water had no effect. Blood from guinea pigs and people also had little effect (Hornbuckle and Beall, 1974).

### Short-Term Stress Measurements

This discussion will be limited to measuring short-term stress induced by handling procedures such as being held in a squeeze chute. Assessment of stress and discomfort should contain both behavioral and physiological measures. Behavioral indicators of discomfort are attempting to escape, vocalization, kicking, or struggling. Other behavioral measures of how an animal perceives a handling procedure are choice tests and aversion tests. Common physiological measures of stress are cortisol, beta endorphin, and heart rate. Cortisol is a useful indicator of short-term stresses from handling or husbandry procedures such as castration. Researchers must remember that cortisol is a time-dependent measure that takes 10 to 20 min to reach peak values (Lay et al., 1992a).

A review of many studies indicates that cortisol levels in cattle fall into three categories: 1) baseline, 2) levels that occur during restraint in a headgate, and 3) extreme stress (Table 1). Cortisol levels are highly variable and absolute comparisons should not be made between studies, but the figures on Tables 1

and 2 would make it possible to determine whether a handling or slaughter procedure was either very low stress or very high stress. One could tentatively conclude that a mean value of >70 ng/mL in either steers or cows would possibly be an indicator of either rough handling or poor equipment, and low values close to the baseline values would indicate that a procedure was either low stress or was very quick. Quick procedures would be completed before cortisol levels could rise. Restraint in a headgate for blood sampling and slaughter produced similar values (Tables 1 and 2). Sexually mature bulls have much lower cortisol levels than steers, cows, or heifers (Tennessee et al., 1984). In one study, there was an extreme mean of 93 ng/mL for inverting cattle on their backs for 103 s (Dunn, 1990). This very high figure is not due to differences in assay methods because this same researcher obtained more reasonable values of 45 ng/mL for upright restraint. Properly performed cattle slaughter seems to be no more stressful than farm restraint (Tables 1 and 2).

Less clear cut ranges have been obtained in sheep. Pearson et al. (1977) found that slaughter in a quiet research abattoir produced lower cortisol levels than slaughter in a noisy commercial plant. The values were 40 vs 61 ng/mL. Values for shearing and other on-farm handling procedures were 73 ng/mL (Hargreaves and Hutson, 1990c,d) and 72 ng/mL (Kilgour and de Langen, 1970). Prolonged restraint and isolation for 2 h increased cortisol levels up to 100 ng/mL (Apple et al., 1993).

Creatine phosphokinase (CPK) and lactate seem to be useful measures for assessing handling stresses in pigs (Warris et al., 1994). Warris et al. (1994) found that the sound level of squealing pigs in a

Table 1. Mean cortisol values in cattle during handling

Cortisol level, ng/mL	Breed	Sex	Study
Baseline			
.5 to 2	Friesian	Bulls	Tennessee et al., 1984
2	Friesian	Cows	Alam and Dobson, 1986
3	Angus cross	Bull calves	Henricks et al., 1984
6	Angus cross	Heifer calves	Henricks et al., 1984
9	Friesland and Nuguni	Cows	Mitchell et al., 1988
Restraint in headgate			
13	Holstein cows	Hand-reared	Lay et al., 1992a
24 (weaned 2 wk before test)	Unknown British or European	Weanlings, mixed sexes	Crookshank et al., 1979
27	Brahman cross	Steers	Ray et al., 1972
28	Angus × Hereford	Steers	Zavy et al., 1992
30	Simmental × Hereford × Brahman	83% Steers	Lay et al., 1992b
36	Angus × Brahman	Steers	Zavy et al., 1992
46 (weaned day of test)	Unknown British or European	Mixed sexes	Crookshank et al., 1979
63	Brahman × Hereford × Afrikander	Steers and heifers	Mitchell et al., 1988
Extreme value			
93 (inverted on back for 103 s)	Unknown British or European	Mixed	Dunn, 1990



Table 2. Mean cortisol values during slaughter

Cortisol level, ng/mL	Handling methods	Study
Baseline quiet research abattoir		
15	Held in head restraint, shot immediately with captive bolt	Tume and Shaw, 1992
Commercial slaughter plant		
24	Handled quietly in conventional stunning box	Ewbank et al., 1992a
32	Unknown	Mitchell et al., 1988
44	Conventional stunning box	Tume and Shaw, 1992
45	Conventional stunning box	Dunn, 1990a
51	Poorly designed head restraint only 14% of cattle voluntarily entered it	Ewbank et al., 1992a
63 (median)	Electric prod all cattle, 38% animals slipped, conventional stun box	Cockram and Corley, 1991a
Extreme stress		
93	Inverted on back for 103 s	Dunn, 1990 <sup>a</sup>

<sup>a</sup>Conducted in either England or Ireland with *Bos taurus* cattle.

commercial abattoir was highly correlated with CPK measurements. White et al. (1995) also reported that vocalizations in pigs were indicative of stress and were correlated with other measures of acute stress, such as heart rate. Cattle that become behaviorally agitated have higher cortisol levels (Stahringer et al., 1989). Heart rate in cattle during restraint in a squeeze chute was highly correlated with cortisol levels (Lay et al., 1992a,b). Stermer et al. (1981) found that rough handling in poorly designed facilities resulted in greater heart rates than quiet handling in well-designed facilities.

Isolation is also a factor in handling stress. During restraint for routine husbandry procedures, animals are often separated from their conspecifics. Stookey et al. (1994) found that cattle became less behaviorally agitated during weighing on a single animal scale if they could see another animal in the chute less than 1 m away in front of the scale. Agitation was measured electronically by measuring movement and jiggling via the scale load cell system. Numerous studies have shown that isolation from conspecifics will raise cortisol and other physiological measures (Kilgour and deLangen, 1970; Whittlestone et al., 1970; Arave et al., 1974).

### Aversion Tests

Aversion to a handling procedure can be measured by either choice testing or measuring aversion. One measure of aversion is the time required to induce an animal to re-enter a chute where it was previously handled (Rushen, 1986a,b 1995). In a choice test, the animals are allowed to choose between two different chutes that lead to different procedures (Grandin et al., 1986; Rushen and Congdon, 1986a,b). Another useful measure is the degree of force required to induce an animal to move through a race. In some cases, measuring the degree of force provides a more accurate assessment of aversion than time. Examples

of force are the number of pats on the rump or number of electrical prods. Experience and genetic factors can confound aversion tests. Rushen (1996) warns that to accurately measure aversion in a race, the animal must experience the aversive procedure more than once. Observations by the author indicate that excitable cattle sometimes run through a single file chute quickly in an attempt to escape. Research (in progress by Bridgette Voisinet and the author) reveals that bulls trained to move through a race to a squeeze chute exhibit no aversion in the race after a single noxious treatment. After one aversive treatment, they continued to voluntarily walk through the race into the squeeze chute, but balking and turning back in the crowd pen at the entrance to the race greatly increased. At this point, the animals may perceive that they may be able to avoid re-entering the race. In aversion studies, balking and other behaviors indicative of aversion must be measured in both the single file race and in the pens and alleys that lead up to the entrance of the single file race. This is especially important if the aversive procedure is performed only once. After the animal is forced to enter the chute that leads to the squeeze, it may perceive that it may be able to escape by running quickly through it toward the squeeze chute. Under certain conditions, choice tests may be unreliable for measuring choices between mildly aversive procedures. Research conducted by Grandin et al. (1994) showed that cattle are reluctant to change a previously learned choice if the two choices in a choice test are only mildly aversive. Other research showed that sheep immediately switched sides to avoid highly aversive electroimmobilization (Grandin et al., 1986).

### Implications

Both researchers and people making decisions about animal welfare must understand that fear during non-painful routine handling and transport can

vary greatly. Fear is a very strong stressor. Cattle that have been trained and habituated to a handling procedure may be completely calm and have baseline cortisol and heart rate measurements during handling and restraint. Extensively reared cattle with an excitable disposition may have very high cortisol levels and show extreme behavioral agitation during the same procedure. For one animal, a squeeze chute may be perceived as neutral and non-threatening, but to another it may trigger an extreme fear response. The animal's response will be determined by a complex interaction of genetics and previous experience. Studies to assess animal welfare during handling and transport should contain both behavioral and physiological measurements.

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# Audiovisuals

## GENERAL

An Introduction to Zoonoses [videocassette]. Manhattan, KS: Kansas State University, College of Medicine; 1991; 1/2" VHS, 18 min.

Keyword: Zoonoses, Q fever, Psittacosis, preventive measures.

Note: Defines zoonoses and illustrates transmission vectors. Q fever from dairy cows and Psittacosis from birds are given as examples of zoonotic diseases with symptoms exhibited by humans. Preventive measures of disease avoidance are discussed.

NAL call number: Videocassette No. 1661.

Animal Handling in Meat Plants [videocassette]. Fort Collins, CO: Grandin Livestock Handling Systems; 1998; 1/2" VHS, 60 min.

Keyword: Slaughter, stunning, packing plants, behavior, sheep, cattle, swine.

Note: This video lecture, delivered by Temple Grandin, Ph.D., covers design and improvement of chutes, races, and holding pens; proper stunning methods, behavioral principles underlying stress-free movement of animals, evaluation of welfare standards in slaughter plants; and effect of animal handling on meat quality.

Farm Animal Behavior Research [videocassette]. Beltsville, MD: National Program Staff, Agricultural Research Service, USDA; 1990; 1/2" VHS, 100 min.

Keyword: Animal behavior, swine behavior, animal welfare, behavioral research.

Note: A videotaping of a seminar given by Dr. Stanley Curtis. Discusses current research in farm animal behavior, with emphasis on swine behavioral research. Addresses issues such as farm animal welfare, psychological well-being, and animal awareness.

NAL call number: Videocassette No. 906.

Farm Animals with Care [videocassette]. England: Datascope Communications (produced for Glaxo Group Research in association with the Institute of Animal Technology); 1991; 1/2" VHS, 2 videocassettes, 65 min.

Keyword: Animal welfare, animal health, livestock, housing.

Note: A two volume series that illustrates regimes for housing and care of sheep, goats, pigs, cattle, and poultry, and provides breeding information and demonstrations of routine health care procedures and blood sampling techniques.

NAL call number: Videocassette No. 1359.

Handling Livestock Naturally [videocassette]. Kansas City, MO: AgriBase, Inc. and the Livestock Marketing Association; 1989; 1/2" VHS, 15 min.

Keyword: Livestock handling, animal welfare, behavior, transport, feeding and watering



in markets, moving animals.

Note: Discusses viewing the world through the animal's eyes when handling them on the farm, for transport and at markets. Covers how to transport with gentleness; understanding of the animal's field of vision, point of balance, flight zone, and blind spot; how to feed and water animals at markets; how to move animals without hitting, yelling, or electric shock; how to deal with medical problems; and design of facilities to reduce injuries.

NAL call number: Videocassette No. 1334.

Livestock in Transit - Handle with Care [videocassette]. Potters Bar, UK: Humane Slaughter Association; 1989; 1/2" VHS, 27 min.

Keyword: Transportation, humane slaughter, animal welfare.

Note: This production discusses and demonstrates humane and safe methods for loading, transporting, and unloading livestock.

NAL call number: Videocassette No. 1306.

Normal and Abnormal Behavior in Domestic Livestock Used for Research [videocassette]. Beltsville, MD: Animal Welfare Information Center, National Agricultural Library; West Lafayette, IN: Purdue University, 1993?; 1/2" VHS, 42 min. Includes 1 script.

Keyword: Livestock behavior, cattle, horses, pigs, stereotypic behaviors.

Note: Examines normal and abnormal behavior in livestock used for research, helping the viewer distinguish between apparently pointless behavior and the possibility of physiological reasons behind behavior such as parasites, injury, genetic problems, or nutritional deficiency.

NAL call number: Videocassette No. 1542.

The Down Side of Livestock Marketing [videocassette]. Watkins Glen, NY: Farm Sanctuary; 1991; 1/2" VHS, 19 min.

Keyword: Livestock marketing, non-ambulatory livestock, animal welfare, stockyards.

Note: Discusses why weak, sick animals are ignored and left to die by stockyards and auction markets and how farmers, livestock truckers, profit margins, and low livestock prices combine to create pressures to overcrowd animals for transport and not to pay for veterinary services when the animals arrive sick at the stockyards or markets.

NAL call number: Videocassette No. 1285.

Understanding Farm Animal Behavior [videocassette]. Minneapolis, MN: University of Minnesota; 1986; 1/2" VHS, 45 min.

Keyword: Cattle, pigs, farm animals, behavior, animal welfare.

Note: Dr. William Hall, Professor of Veterinary Medicine at the University of Illinois, and Dr. William Rempel, Professor of Animal Science at the University of Minnesota, discuss and explain aspects of farm animal behavior. The panelists field questions from the moderator and the audience. The discussion touches on factory farming and animal rights.

NAL call number: Videocassette No. 367.

# CATTLE

Basic Herding [videocassette]. Kamuela, HI: Graziers Hui; 1993; 1/2" VHS, 50 min. Includes manual and booklet.

Keyword: Cattle, herding, handling.

Note: Burt Smith discusses stockmanship, herding, and handling of cattle. The video includes practice sessions and practical exercises.

NAL call number: Videocassette No. 2166.

Beef Management Practices I [videocassette]. College Station, TX: Texas A&M University; 1987; 1/2" VHS, 24 min. Includes a summary, quizzes, and answers.

Keyword: Beef cattle, handling, restraint, branding, dehorning, techniques.

Note: This instructional video covers handling and restraint techniques and facilities, branding and other identification, vaccination techniques, growth stimulant implantation, and dehorning.

Beef Management Practices II [videocassette]. College Station, TX: Texas A&M University; 1987; 1/2" VHS, 46 min. Includes a summary, quizzes, and answers.

Keyword: Beef cattle, handling, techniques.

Note: This instructional video covers castration, treatment for parasites, palpation, and artificial insemination.

Bovine Restraint [videocassette]. East Lansing, MI: Michigan State University; 1976; 1/2" VHS, 12 min.

Keyword: Cattle, handling, restraint.

Note: Demonstrates a number of ways to restrain cows including the use of the rope halter, nose lead, and burley casting methods.

NAL Call No.: Videocassette No. 2042.

Calving Management [videocassette]. AG-COM Productions, 40 min. (available from Prairie Farm Report Video Library)

Calving Time Management/Equipment [videocassette]. Ames, IA: Iowa State University Cooperative Extension Service and WOI-TV. Distributed by RMI Media Productions, Shawnee Mission, KS; 1980?; 1/2" VHS, 24 min.

Keyword: Cattle parturition, birthing.

Note: Basic management of the calving process. Describes needed equipment and discusses basic techniques.

NAL call number: Videocassette No. 1440.

Cattle Handling [videocassette]. Alberta Agriculture, Food, and Rural Development, 1993, 19 min.

Keyword: Cattle, handling, behavior, facility design.



Note: Explains connection between safe, efficient handling and an understanding of cattle behavior. Examines effectiveness of cattle handling facilities from the cattle's point of view.

NAL call number: Videocassette No. 2607.

Cattle Handling #1 [videocassette]. AG-COM Productions, 60 min. (available from Prairie Farm Report Video Library)

Cattle Handling #2 [videocassette]. AG-COM Productions, 55 min. (available from Prairie Farm Report Video Library)

Cattle Handling Principles to Reduce Stress [videocassette]. Fort Collins, CO: Grandin Livestock Handling Systems; 1998; 1/2 VHS, 60 min.

Keyword: Cattle, handling, stress, moving cattle, facility design.

Note: In this video lecture, Dr. Temple Grandin explains how to use behavioral principles and facility design for low stress cattle movement. Design of efficient chutes, the flight zone and point of balance, temperament selection, and basic ways to reduce stress are discussed.

Cattle Handling and Transportation [videocassette]. Amarillo, TX: Livestock Conservation Institute; 1988; 1/2" VHS, 18 min. Includes 2 booklets.

Keyword: Beef cattle, behavior, handling, transport, loading, moving cattle.

Note: This training video explains the basics of cattle behavior as it relates to moving and transporting livestock efficiently and humanely. Vision, reaction to noise, flight zone, natural circling, and following behavior are discussed. Other topics include overcrowding in pens, use of squeeze chutes, loading and unloading trucks, truck-driving techniques, and temperature stress during transportation.

NAL call number: Videocassette No. 422.

Cattle Handling and Transportation [videocassette]. San Luis Obispo, CA: Visual Education Productions, California Polytechnic State University; 1988; 30 min. Includes one copy each of Livestock Handling Guide and Livestock Trucking Guide.

Keyword: Cattle, handling, transport, moving cattle, behavior.

Note: Covers principles of cattle behavior upon which good handling and transportation practices are based.

Cattle Management [videocassette]. AG-COM Productions, 60 min. (available from Prairie Farm Report Video Library)

Cattle Restraint with the Ropes [videocassette]. Knoxville, TN (?): University of Tennessee Agricultural Engineering Department (?), 1990, 22 min.

Keyword: Cattle, restraint, halter, handling.

Note: Explains techniques of cattle restraint using bare hands and ropes.

Cow Handling [videocassette]. Davis, CA: University of California; 1980; U-Matic 3/4", 19 min. (Vol. 1), 40 min. (Vol. 2).

Keyword: Cows, restraint, handling, veterinary medicine, biomedical techniques.

Note: Volume 1 demonstrates techniques for manually restraining the cow. The tape illustrates the use of the halter, nose ring, nose lead, and hobbles, and demonstrates techniques for manipulating the tail and preventing kicks. Volume 2 demonstrates the following biomedical procedures: blood collection, vein location, bone marrow biopsy, injections, drenching, minor teat surgery, treatment of displaced abomasum and carcinoma of the eye, and use of the stomach tube, dose syringe, balling gun, and speculum.

NAL call number: Videocassette No. 227.

Dairy Production and Management [videocassette]. (MSU?) Pennsylvania State University Ag, 1983, 35 min. (available for loan from Penn State Audiovisual Services, also from Purdue University)

Keyword: Dairy cattle, handling, restraint, behavior, animal health.

Note: Identifies healthy and unhealthy dairy cattle by observation. Covers correct handling and restraint procedures, young stock management, and normal movement and body positions of dairy cows.

Dairy Safety: It's No Accident [videocassette]. San Luis Obispo, CA: Vocational Education Productions, California Polytechnic State University; 1991; 1/2" VHS, 26 min.

Keyword: Dairy cattle, handling, dairy farming, safety.

Note: Covers safe animal handling practices for dairy farms during milking, calving, and routine management procedures such as castration and de-horning. Also discusses general farm safety.

NAL call number: Videocassette No. 2537.

Dehorning Cattle [videocassette]. San Luis Obispo, CA: Da-Nel Productions and Vocational Education Productions; 1985; 1/2" VHS, 25 min.

Keyword: Dehorning, cattle, techniques, horns, physiology, purpose, animal welfare.

Note: Discusses why and when cattle are dehorned. Provides information on horn growth and its physiology. Gives techniques used and at what age. Demonstrates several methods of dehorning. Discusses restraint and veterinary care needs.

NAL call number: Videocassette No. 844.

Footcare in Cattle [videocassette]. Ipswich, UK: Farming Press Videos. Distributed in N. America by Diamond Farm Enterprises, Alexandria Bay, NY; 1992; 1/2" VHS, 55 min.

Keyword: Cattle, footcare, hoof trimming.

Note: Roger Blowey demonstrates hoof structure and hoof trimming of cattle.

NAL call number: Videocassette No. 2493.

Freeze Branding & Hot Branding Cattle [videocassette]. San Antonio, TX: International Brangus Breeders Association; 1988; 1/2" VHS, 19 min.

Keyword: Cattle, branding.

Note: Demonstrates equipment and procedures used to freeze brand and hot brand cattle.

NAL call number: Videocassette No. 2683.



Improve Cattle Handling for Greater Profits [slide]. Madison, WI: Livestock Conservation Institute; 1980; 68 slides and one 12 min. audiocassette.

Keyword: Cattle, handling.

Note: Temple Grandin presents principles of cattle handling that reduce injuries and bruising.

NAL call number: Slide No. 252.

Tattooing & Grooming Cattle for Show [videocassette]. San Antonio, TX: International Brangus Breeders Association; 1986; 1/2" VHS, 13 min.

Keyword: Cattle, show animals, handling.

Note: Demonstrates equipment and procedures needed to tattoo and groom show cattle.

NAL call number: Videocassette No. 2682.

The Feedyard [videocassette]. Lubbock, TX: Creative Educational Video; 1994; 1/2" VHS, 30 min.

Keyword: Beef cattle, feedlot, handling, facility design, techniques, animal health.

Note: Provides a comprehensive look at modern feedlot operation. Covers design, construction, and financial management of facilities; correct cattle processing techniques; feeding; and treatment procedures for sick or injured cattle.

NAL call number: Videocassette No. 2576.

Understanding Dairy Cattle Behavior to Improve Handling and Production [videocassette]. Madison, WI: Livestock Conservation Institute; 1992; 1/2" VHS, 24 min.

Keyword: Dairy farming, dairy cows, behavior, handling, milk production.

Note: Provides insight into dairy cattle behavior for handlers and herders. Gives suggestions to reduce handling stress which can result in improved milk production.

NAL call number: Videocassette No. 2036.

Youth and Dairy Cattle: A Safe Partnership [videocassette]. Bowling Green, KY: Livestock Conservation Institute; 1/2" VHS, 16 min. Includes five instructional guides.

Keyword: Dairy cows, behavior, handling, youth, halter, show animals.

Note: Aimed at young people working with dairy cattle, this video explains halter training, leading, loading, and transporting. Information about dairy cattle behavior is provided.

NAL call number: Videocassette No. 2483.

# GOATS

Dairy Goat: Applying Health Care Practices / Beyond the Pail: Modern Milking Practices [videocassette]. Pennsylvania State University Ag; 1982; 1/2" VHS, 41 min. (available for loan from Penn State Audiovisual Services)

Keyword: Goats, health, milk production.

Note: Part 1 covers health care practices. Part 2 demonstrates how to handle the doe during milking for maximum milk production.

Goat Breeding and Kid Rearing [videocassette]. Ipswich, UK: Farming Press Videos; Distributed in N. America by Diamond Farm Enterprises of Alexandria Bay, NY; 1995; 1/2" VHS, 63 min.

Keyword: Goats, breeding, husbandry.

Note: Part 1 of a two-part series by goat breeder Hilary Matthews aimed at domestic goatkeepers. Covers breeding management, care of the pregnant goat, assisted and unassisted births, and care of the newborn.

NAL call number: Videocassette No. 2665.

Goat Husbandry and Health [videocassette]. Ipswich, UK: Farming Press Videos; Distributed in N. America by Diamond Farm Enterprises of Alexandria Bay, NY; 1996; 1/2" VHS, 48 min.

Keyword: Goats, husbandry, animal health.

Note: Part 2 of Hilary Matthews' series on domestic goatkeeping.

Maintaining Herd Health and Milking Management [videocassette]. Winrock; 1982; 1/2" VHS, 41 min. (available from Purdue Instructional Media Center)

Keyword: Goats, health, handling, milk production.

Note: Describes proper use of health care equipment to maintain goat herd health.

Identifies proper procedures for handling the doe while milking to maximize milk production.



## HORSES

A Guide to Foal Handling [videocassette]. Clovis, CA: The Discovery Trail. Distributed by Betsy Beineke, Powder Springs, GA; 1990; 1/2" VHS, 34 min.

Keyword: Foals, handling, imprinting.

Note: Betsy Beineke presents her methods of foal handling. This involves imprinting the foal's nervous system and bonding with the foal.

NAL call number: Videocassette No. 2053.

Advanced Training of the Western Horse [videocassette]. Alberta, Canada: Alberta Agriculture, Food, and Rural Development; 1984; 1/2" VHS, 15 min.

Keyword: Horse training, western show horses.

Note: Third in a series on training western show horses. Top Canadian riders present their techniques for quarter-horse training for various purposes, including show and ranch work.

NAL call number: Videocassette No. 2680.

Barn Construction [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, ca. 30 min.

Keyword: Stables, design, barn, construction, costs.

Note: Tours of several horse barns demonstrate factors such as fire safety, appearance, durability, function, and cost which influence barn design.

NAL call number: Videocassette No. 1896.

Basic Horse Care [videocassette]. Omaha, NE: Farnam Companies; 1986; 1/2" VHS, 80 min.

Keyword: Horses, care, training, handling, behavior, loading.

Note: An introduction to horse care covering feeding, grooming, safety, medications, loading, trailering, horse psychology, and handling.

NAL call number: Videocassette No. 2594.

Basic Horse Training [videocassette]. Alberta, Canada: Alberta Agriculture, Food, and Rural Development; 1981; 1/2" VHS, 15 min.

Keyword: Horse training.

Note: Techniques for training pleasure horses explained by horse trainer Bill Collins.

NAL call number: Videocassette No. 2678.

Basic Horseshoeing Principles [videocassette]. LaPorte, CO: Butler Publishing and Tools; 1992; 1/2" VHS, 55 min.

Keyword: Horseshoeing, hoof trimming, cold shoeing.

Note: Dr. Doug Butler demonstrates cold shoeing and hoof trimming techniques that are used in shoeing horses.

NAL Call No.: Videocassette No. 1904.

Beating Muscle Injuries in Horses [videocassette]. West Bath, ME: Diamond Video Productions; 1981; 1/2" VHS, 72 min.

Keyword: Wounds and injuries, physiological aspects.

Note: Care and prevention of equine muscle injuries is detailed by author Jack Meagher.

NAL call number: Videocassette No. 1934.

Breaking Yearlings [videocassette]. Lexington, KY: Blood-Horse Productions; 1985; 1/2" VHS, 38 min.

Keyword: Horses, yearlings, breaking, training for racing.

Note: Shows step by step procedures that professionals have found successful in breaking yearlings and developing race horse potential.

NAL call number: Videocassette No. 1895.

Broodmare Management [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, 32 min.

Keyword: Thoroughbred horse breeding, mares, management.

Note: Describes a management program for the breeding of thoroughbred horses, with emphasis on the care and preparation of the mare. Discusses the use of artificial lighting, a teasing program, rectal palpation, use of hormones, diagnostic ultrasound examination, endoscopic examination, clinics for infertile mares, breeding sheds, and the shipping of foaling mares. The intended audience for this program is thoroughbred horse breeders.

NAL call number: Videocassette No. 1891.

Conformation [videocassette]. Lexington, KY: Blood-Horse Productions; 1985; 1/2" VHS, ca. 40 min.

Keyword: Horses, conformation, training, defects.

Note: Illustrates good horse conformation and examples of conformation defects, some of which may be acceptable to trainers and some not acceptable.

NAL call number: Videocassette No. 1894.

Early Learning: The Complete Training of the Newborn Foal During Its Imprinting & Critical Learning Periods [videocassette]. Virginia City, NV: Video Velocity, 1995, 120 min.

Keyword: Horse training, foal, imprinting.

Note: Veterinarian Robert Miller demonstrates how techniques used during the first 24 hours of a foal's life results in a horse which reacts well to grooming, hoof-trimming, vet exams, and trailer loading.

NAL call number: Videocassette No. 2593.

Educating Your Foal [videocassette]. La Jolla, CA: Lawlor Productions; 1987; 1/2" VHS, 54 min.

Keyword: Foals, handling, behavior.

Note: T.E.A.M. (Tellington-Jones Equine Awareness Method) solutions are discussed for preparing a foal for future training by awakening its thinking, focus, and hoof-eye coordination.

NAL call number: Videocassette No. 2140.

Emergency Care [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, 32



min.

Keyword: Horses, diseases, injuries, veterinary care, diagnosis, physical examination.

Note: A veterinarian demonstrates a routine physical examination which could be performed by a farm manager when faced with a sick or injured horse.

NAL call number: Videocassette No. 1898.

Facility Considerations for Horse Farms [videocassette]. 37 min., VT-189 (available from Oklahoma State University Cooperative Extension)

Keyword: Facility design, horses.

Note: Discusses objectives, placement, materials, design, and engineering of horse farm sites and buildings.

Fancy Footwork: Horseowner's Guide to Sound Shoeing Practices [videocassette]. Equalign; 1992; 1/2" VHS, 60 min.

Keyword: Horseshoeing.

Note: Meredith Clarke explains the intricate relationship between the structure and function of the foot and demonstrates correct shoeing procedures.

NAL call number: Videocassette No. 1903.

Foal Management [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, ca. 30 min.

Keyword: Horse breeding, foals, handling, horse diseases.

Note: Visits to several horse breeding farms afford an insight into the importance of early handling, vaccination and feeding programs, illnesses common to the young horse, and proper hoof care.

NAL call number: Videocassette No. 1892.

Foaling [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, 28 min.

Keyword: Horses, mares, birth management, foaling.

Note: Discusses the preparations for producing a healthy foal and the proper procedures for handling the birth.

NAL call number: Videocassette No. 1893.

Foaling Fundamentals: A Video Handbook for Healthy Foaling [videocassette]. Virginia City, NV: Video Velocity; 1989; 1/2" VHS, 52 min. Includes a guide book.

Keyword: Foals, birth, postnatal care, mares, reproduction.

Note: Covers care of pregnant mare, foaling equipment and facilities, and all aspects of postnatal care.

NAL call number: Videocassette No. 2011.

Foaling Your Mare [videocassette]. Cuba, NY: Hemlock Brook Farm; 1988. 1/2" VHS, 50 min.

Keyword: Mares, foals, reproductive cycle, birth process, normal and abnormal delivery.

Note: The video illustrates the reproductive cycle in the mare from conception to foaling to weaning. See the birth of several foals, including hard deliveries, and learn what to look for in case of trouble and how to help your mare deliver a healthy live foal.

NAL call number: Videocassette No. 1939.

Ground Handling Horses Safely [videocassette]. University of Idaho; 1995; 18 min. (available on loan from Penn State Audiovisual Services)

Keyword: Horses, handling.

Haltering a Foal without Trauma with T.E.A.M. [videocassette]. La Jolla, CA: Lawlor Productions; 1987; 1/2" VHS, 42 min.

Keyword: Foals, handling, halter.

Note: T.E.A.M. (Tellington-Jones Equine Awareness Method) solutions are discussed for teaching your foal to halter and lead without the fear and emotional shock of traditional methods.

NAL call number: Videocassette No. 2138.

Hands-on Horse Care [videocassette]. Santa Rosa, CA: Hands-on Animal Care; 1992, 1/2" VHS, over 60 min.

Keyword: Horses, handling, stress reduction, massage.

Note: Diana Thompson demonstrates the use of massage and acupressure to treat colic, shock, nervousness, fatigue, and stress in the horse. Also explains how to read a horse's body language.

NAL call number: Videocassette No. 2622.

Health Programs for Horse Farms [videocassette]. 41 min., VT-190 (available from Oklahoma State University Cooperative Extension)

Keyword: Horse health, biomedical techniques.

Note: Demonstrates common health procedures and first aid techniques used on horse farms, including checks of heart rate, blood pressure, temperature, and respiration, and injection, vaccination, and de-worming.

Horse Safety [videocassette]. Alberta, Canada: Alberta Agriculture, Food, and Rural Development; 1/2" VHS, 24 min.

Keyword: Horse handling, safety.

Note: Demonstrates proper handling techniques to use in potentially dangerous situations.

Horse Sense for Kids [videocassette]. Stillwater, OK: Department of Agricultural Communications, Oklahoma State University, and Oklahoma Cooperative Extension Service; 1992; 1/2" VHS, 21 min.

Keyword: Horse handling, safety, children.

Note: Presents safety tips to children for handling horses.

NAL call number: Videocassette No. 2424.

Imprint Training the Foal [videocassette]. Thousand Oaks, CA: Palomine Productions. Distributed by Miller's, East Rutherford, NJ; 1985; 1/2" VHS, 60 min.

Keyword: Foals, training, imprinting, horse behavior.



Note: Robert Miller covers the training of foals from the time of birth through their first months to gentle them, prepare them for future schooling, and minimize injury to handlers.

NAL call number: Videocassette No. 1902.

Intermediate Horse Training [videocassette]. Alberta, Canada: Alberta Agriculture, Food, and Rural Development; 1983, 1/2" VHS, 15 min.

Keyword: Horse training.

Note: Second video in a series (the first is "Basic Horse Training") on training the western pleasure horse. Bill Collins describes how to use mechanical aids and perform basic maneuvers.

NAL call number: Videocassette No. 2679.

Loading and Trailing Horses [videocassette]. Alberta, Canada: Alberta Agriculture, Food, and Rural Development; 1/2" VHS, 26 min.

Keyword: Horse handling, loading, transport, safety.

Note: Bill Collins discusses how to select appropriate equipment and how to drive, how to load horses safely, and how to handle young and problem horses.

Powell Breaking Technique: Teaching by Asking [videocassette]. 1/2" VHS, 120 min., VT-96 (available from Oklahoma State University Cooperative Extension)

Keyword: Horse training.

Note: Horse trainer Sam Powell demonstrates how to break a young horse to ride.

Safely Handling Breeding Stallions and Mares with T.E.A.M. [videocassette]. La Jolla, CA: Lawlor Productions; 1987; 1/2" VHS, 71 min.

Keyword: Horses, breeding stock, handling.

Note: T.E.A.M. (Tellington-Jones Equine Awareness Method) solutions are discussed for training horses without anxiety and overexcitation, to improve the breeding process and attitudes and performance.

NAL call number: Videocassette No. 2139.

Shoeing the Horse [videocassette]. Florida: Edmar Video Productions; 1985; 1/2" VHS, 29 min.

Keyword: Horseshoeing.

Note: Licensed farrier Todd Parmenter demonstrates the fundamentals of horseshoeing.

NAL call number: Videocassette No. 2609.

Showmanship - The Basics [videocassette]. JPI & Associates; 1991; 1/2" VHS, 29 min. 30 sec. (available from New Mexico State University)

Keyword: Handling, show horses, care.

Note: Demonstrates how to handle a horse in the show arena and provides basic horse care information.

NAL call number: IPM970904650.

Stallion Management [videocassette]. Lexington, KY: Blood-Horse Productions; 1984; 1/2" VHS, 30 min.

Keyword: Horse breeding, stallions, management.

Note: Discusses how to maintain stallions that have the best possible chance to get the mares in foal.

NAL call number: Videocassette No. 1897.

Starting a Young Horse [videocassette]. Omaha, NE: Farnam Companies, Inc.; 1986; 1/2" VHS, 90 min.

Keyword: Horses, training methods, training the horse for riding.

Note: The video will take you through the basic steps for preparing a horse for riding. Tellington-Jones demonstrates the body work and ground exercises including using a whip as a "wand", how to use driving reins, preparation for lunging, preparing the horse to accept a bit, the first steps of saddling, plus much more. All of these exercises and techniques will result in a smooth transition to the final goal of riding the horse.

NAL call number: Videocassette No. 1969.

T Touch for Horses [videocassette]. La Quinta, CA: Thane Marketing International; 1994; 1/2" VHS, 47 min.

Keyword: Horses, training, pain, behavior, stress.

Note: Linda Tellington-Jones demonstrates how touches can be used to change a horse's behavior and also to ease pain and stress associated with old age, injuries, or surgery.

NAL call number: Videocassette No. 2355.

Teaching the Yearling [videocassette]. Powder Springs, GA: Betsy Beineke; 1992; 1/2" VHS, 45 min.

Keyword: Training horses, yearlings, positive interaction techniques.

Note: Useful for those handling their first yearling as well as for those breeders and trainers who have had difficult yearlings in the past, this program gives clear and useful information about how to use the yearling year to develop a positive interaction between horse and trainer.

NAL call number: Videocassette No. 1900.

T.E.A.M. Learning Exercises, Part 1: Awareness Movements [videocassette]. La Jolla, CA: Lawlor Productions; 1988; 1/2" VHS, 68 min.

Keyword: Horses, training, behavior.

Note: These balancing exercises for horse and rider can improve problems such as nervousness, lack of coordination, and lack of concentration by working from the ground instead of the saddle.

NAL call number: Videocassette No. 2141.

T.E.A.M. Learning Exercises, Part 2: Obstacles and Groundwork [videocassette]. La Jolla, CA: Lawlor Productions; 1988; 1/2" VHS, 62 min.

Keyword: Horses, training, behavior.



Note: Linda Tellington-Jones demonstrates how to apply her methods to such problems as nervousness, whirling, poor balance, lack of coordination, stubbornness, and shying.

NAL call number: Videocassette No. 2142.

The Physical Exam [videocassette]. Merritt Island, FL: K-F Equine Video Production, Inc.; 1987; 1/2" VHS, 70 min.

Keyword: Horses, buying stock, basic anatomy, common diseases, scoring condition.

Note: Dr. Floyd D. Kirby teaches the prospective buyer how to examine a horse with a view toward what conditions might be present and how serious these conditions are. Problem areas covered include: eyes, mouth, ears, skin, lameness, locomotion and internal problems.

NAL Call No.: Videocassette No. 1935

The Principles of Horseshoeing: The Sound Horse [videocassette]. LaPorte, CO: Butler Publishing and Tools; 1987; 1/2" VHS, 55 min.

Keyword: Horseshoeing, normal conditions.

Note: Describes machine-made shaping, cold shoeing, handmade shoeing and hot shoeing for the sound horse.

NAL call number: Videocassette No. 1938.

The T Touch That Teaches, Part I: Head and Neck [videocassette]. La Jolla, CA: Lawlor Productions; 1988; 1/2" VHS, 60 min.

Keyword: Horses, training, pain, injury, nervous system, behavior.

Note: Linda Tellington-Jones explains and demonstrates how sore muscles, tender spots and behavioral problems of horses can be overcome by the use of touches and body awareness, described as the Tellington-Jones Equine Awareness Method. These techniques can be easily learned and used by the novice or professional.

NAL call number: Videocassette No. 1319.

The T Touch That Teaches, Part II: Body, Legs, and Tail [videocassette]. La Jolla, CA: Lawlor Productions; 1988; 1/2" VHS, 70 min.

Keyword: Horses, training, pain, injury, nervous system, behavior.

Note: Part II of this series further demonstrates the use of the Tellington Touch to locate and relieve areas of pain, tension, and discomfort. Through T.E.A.M. (Tellington-Jones Equine Awareness Method), the horse becomes more aware of its body and movement, thus improving performance.

NAL call number: Videocassette No. 1320.

Think Like a Horse [videocassette]. Richmond, CA: Communication Arts; 1992; 1/2" VHS, 37 min.

Keyword: Wild horses, handling, behavior, care.

Note: In this video aimed at adopters of wild horses, Mary Ann Simonds describes wild horse handling and care. She also discusses how the wild horse's feelings and behavior affect training.

NAL call number: Videocassette No. 2636.

Tips for Safe Horse Handling [videocassette]. Belleview, FL: Dillon Video Productions; 1990; 1/2" VHS, 24 min.

Keyword: Horses, foals, handling, restraint.

Note: Illustrates safe handling methods/practices for horses and foals.

NAL call number: Videocassette No. 1946.

Weaning [videocassette]. Lexington, KY: Blood Horse Productions; 1984; 1/2" VHS, ca. 32 min.

Keyword: Weaning, horses.

Note: Weaning programs at four horse farms are discussed.

NAL call number: Videocassette No. 1899.

When Should I Call the Vet? [videocassette]. La Jolla, CA: Lawlor Productions; 1988; 1/2" VHS, 104 min.

Keyword: Horses, diseases, normal behavior, diagnosis, colic, injuries, hoof problems, veterinary care.

Note: This set of two videocassettes is part of the Equestrian Horse Video Series. Pam Lawlor discusses the various indicators and conditions that can affect a horse and when you should seek veterinary help. In Part 1, *Finding the norm for your horse*, there is a discussion of normal behaviors and activities for a horse. Part 2, *Colic, wounds and hoof ailments*, addresses the symptoms and seriousness of those conditions that require veterinary care.

NAL Call No.: Videocassette No. 1910.



## LLAMAS

All About Llamas [videocassette series]. Bozeman, MT: Taylor/Gavin Communications; 1986; 1/2" VHS, 45 min. (each video).

Keyword: Llamas, care, handling, management, history, uses, behavior, breeding, birthing, packing, hiking.

Note: This series consists of three videotapes. Tape #1 - *Llama Basics discusses the history, care, and handling of llamas*. Tape #2 - *Breeding, Birthing, and Newborn Care* covers the basics of breeding, natural delivery, delivery assisting, and newborn care. Tape #3 - *Let's Go Packing* discusses the use of llamas as pack animals for hiking and outdoor adventures.

NAL call number: Videocassette No. 1330.

Basic T.E.A.M. with Llamas [videocassette]. Olympia, WA: Juniper Ridge Press; 1990; 1/2" VHS, 112 min.

Keyword: Llamas, training, techniques.

Note: Presents the basics of Tellington-Jones Equine Awareness Method (T.E.A.M.) as a way to train llamas.

NAL call number: Videocassette No. 1770.

Llama Reproduction: A Neonatal Clinic [videocassette]. Olympia, WA: Juniper Ridge Press; 1989; 2 videocassettes, 1/2" VHS, 3 hr., 34 min. Includes one booklet.

Keyword: Llamas, reproduction, assisted delivery.

Note: Through lecture, slides, and live footage, Dr. LaRue Johnson presents his clinic covering llama reproductive anatomy, breeding, fetal development, birth, and newborn care. He also covers the delivery of crias in a variety of positions, using plastic uteruses and stillborn crias.

NAL call number: Videocassette No. 2356.

Llama Training with Bobra Goldsmith: What Every Llama Should Know [videocassette]. Ashland, OR: Juniper Ridge Press; 1986; 1/2" VHS, 114 min.

Keyword: Llamas, training, care, maintenance, handling.

Note: Bobra Goldsmith narrates and demonstrates techniques for the training of llamas. These techniques are taught in order to allow proper and stress-free handling, care, and management of your llama.

NAL call number: Videocassette No. 1358.

## POULTRY

Handling Live Birds [videocassette]. University Park, PA: Pennsylvania State University Ag; 1988; 1/2" VHS, 20 min. (available for loan from Penn State Audiovisual Services)

Keyword: Hens, handling.

Note: Demonstrates correct method for holding hens to examine for behavioral and physical characteristics related to health and performance.

Poultry at Home [videocassette]. Ipswich, UK: Farming Press Videos. Distributed in N. America by Diamond Farm Enterprises, Alexandria Bay, NY; 1993; 1/2" VHS, 77 min.

Keyword: Raising chickens, basic management, health.

Note: A beginner's guide to poultry health and management. Victoria Roberts and Julie Musk use over 50 pure breeds to illustrate the various points. Topics include: choosing your breed, housing, handling, predators, feed and digestion, diseases and parasites, breeding, sexing, candling eggs, and rearing chicks.

NAL call number: Videocassette No. 1914.

Poultry Heat Stress [videocassette]. 1 hr., TC-33 (available from Oklahoma State University Cooperative Extension)

Keyword: Chickens, heat stress, management.

Note: Techniques to alleviate heat stress of poultry during hot weather.

Restraint and Handling of the Bird [videocassette]. Davis, CA: School of Veterinary Medicine, University of California at Davis; 1978; 1/2" VHS, 12 min.

Keyword: Birds, handling, restraint.

Note: Discusses common anatomical characteristics of all birds. Common physical and chemical restraint techniques used on most birds are demonstrated.

NAL call number: Videocassette No. 1907.



## RATITES

Emu: Handling, Banding, Transport, and Sexing [videocassette]. Lampasas, TX: Janice Castleberry; 1997; 1/2" VHS.

Keyword: Emu, handling, transport.

NAL call number: IPM970905655.

Emu: Pen Facilities, Feeding, Breeding, and Hatching [videocassette]. Lampasas, TX: Janice Castleberry; 1997; 1/2" VHS.

Keyword: Emu, facilities, breeding.

NAL call number: IPM970905654.

Emu Management and Production [videocassette]. College Station, TX: Wildlife and Exotic Teleconsultants; 1997; 1/2" VHS.

Keyword: Emu, husbandry.

NAL call number: IPM970904654.

Ostrich Management and Production [videocassette]. College Station, TX: Wildlife and Exotic Teleconsultants; 1993; 1/2" VHS.

Keyword: Ostrich, husbandry.

NAL call number: IPM970904633.

Raising Emu and Rhea [videocassette]. Kerrville, TX: Sportsmen on Film; 1993; 1/2" VHS, 60 min.

Keyword: Emu, rhea, husbandry.

NAL call number: Videocassette No. 2584.

Ratite Management in a Nutshell, Part I [videocassette]. Lawton, OK: Fergus Video Productions; 1992; 1/2" VHS, 2 hrs., 30 min.

Keyword: Ratites, care, facilities, transport.

Note: Covers facilities, bird selection, transportation, and incubation of ratites.

NAL call number: IPM970904630.

Ratite Management in a Nutshell, Part II [videocassette]. Lawton, OK: Fergus Video Productions; 1992; 1/2" VHS, 2 hrs., 30 min.

Keyword: Ratites, care, health.

Note: Covers chick and yearling management and flock health.

NAL call number: IPM970904630.

Rhea Intensive Farming [videocassette]. Utopia, TX: Hosman/Ramsey Rheas; 1993; 1/2" VHS, 45 min.

Keyword: Rhea, husbandry.

NAL call number: Videocassette No. 2664.

## SHEEP

Care and Maintenance of Shearing Equipment [videocassette]. Colso (?); 1975; 1/2" VHS, 30 min. (available from Purdue University Instructional Media Center)

Keyword: Sheep, shearing, equipment.

Note: Shearing expert Charles Swaim demonstrates the proper way to prepare and care for shearing equipment to prevent cutting the sheep's skin and how to position the blades for the best direction of movement.

Lamb Evaluation: Ewe Evaluation [videocassette]. Ames, IA: Iowa State University Cooperative Extension Service. Distributed by RMI Media Productions, Shawnee Mission, KS; 198?; 1/2" VHS, 27 min.

Keyword: Sheep, lambs, ewes, visual and tactile evaluation, marketing.

Note: How to evaluate market lambs using hands and eyes. How to judge breeding ewes.

NAL call number: Videocassette No. 1350.

Lamb Survival [videocassette]. Ipswich, UK: Farming Press Videos. Distributed in N. America by Diamond Farm Enterprises, Alexandria Bay, NY; 1993; 1/2" VHS, 84 min.

Keyword: Lambs, post natal care.

Note: David Henderson presents techniques to help lambs survive their first few days of life.

NAL call number: Videocassette No. 1937.

Planning a Working Facility for Sheep [videocassette]. University Park, PA: Pennsylvania State University Ag; 1979; 16 min. (available for loan from Penn State Audiovisual Services)

Keyword: Sheep, facility design, handling.

Note: Explains the design and construction of efficient sheep handling facilities and the uses of the different pieces of equipment.

Sheep Handling and Feed Equipment [videocassette]. Winrock; 1982; 1/2" VHS, 22 min. (available from <http://elroy.nmsu.edu/WebCatalog/Web> [New Mexico State University, Department of Agricultural Communications])

Keyword: Sheep, handling, feeding.

Note: Describes equipment and techniques used in handling and feeding the sheep flock.

NAL call number: IPM970904649.

Sheep Management Practices I [videocassette]. Lubbock, TX: Creative Educational Video; 1989; 1/2" VHS, 54 min.

Keyword: Sheep, management, handling, restraint.

Note: This instructional video covers characteristics of sheep, housing and facilities, handling and restraint, lambing, tail docking, and castration. Includes a summary with quizzes and answers.

NAL call number: Videocassette No. 2580.



Sheep Management Practices II [videocassette]. Lubbock, TX: Creative Educational Video; 1989; 1/2" VHS, 43 min.

Keyword: Sheep, management, parasites, shearing.

Note: This instructional video covers identification, parasite control, foot care, and shearing. Includes a summary with quizzes and answers.

NAL call number: Videocassette No. 2581.

# SWINE

Animal Handling Workshop: Temple Grandin, Pork N.S. [2 videocassettes]. (available from Nova Scotia Agricultural College)

Artificial Insemination in Swine [videocassette]. East Lansing, MI: Instructional Media Center, Michigan State University; 1981; 1/2" VHS, 15 min. 50 sec.

Keyword: Swine, artificial insemination, breeding, methods, equipment.

Note: Demonstrates the current methods and equipment for artificially inseminating swine.

NAL call number: Videocassette No. 1726.

Human/Pig Behaviour [videocassette]. Owatonna, MN: PigWorld, Inc; 199?, 1/2" VHS, 20 min.

Keyword: Pigs, behavior, handling, facilities, human/animal interaction.

Note: Discusses human/pig interaction, pig handling facilities and techniques, and the perceptions and behavior of pigs.

NAL call number: Videocassette No. 2601.

Injection Techniques for Swine [videocassette]. Des Moines, IA: National Pork Producers Council; Pork Quality Assurance Video Series - #1; 1996; 1/2" VHS, 17 min. Includes booklet, guide, and quiz.

Keyword: Swine, techniques, injection, restraint.

Note: Covers medication types, injection sites, routes of administration, restraint methods, and needle size and gauge.

NAL call number: Videocassette No. 2359.

Managing Difficult Farrowing [videocassette]. Purdue University School of Veterinary Medicine; 1984; 1/2" VHS, 30 min. (available from Purdue Instructional Media Center)

Keyword: Swine, farrowing.

Note: Lewis Runnels, DVM, discusses proper methods for aiding a sow during a difficult farrowing. Stresses the importance of gentleness, sanitation, and lubrication in order to avoid complications and damage with examinations and manual pig deliveries. Looks at exam techniques, delivery procedures, use of medical instruments, reasons for problems in delivery, and post-partum care.

Practical Outdoor Pig Production [videocassette]. Ipswich, UK: Farming Press Videos. Distributed in N. America by Diamond Farm Enterprises, Alexandria Bay, NY; 1993; 1/2" VHS, 40 min.

Keyword: Swine breeding, housing, record keeping.

Note: Features examples of breeding units showing basic requirements, essential services, housing and equipment, records, and integration with other farming enterprises.

NAL call number: Videocassette No. 1912.

Processing Techniques for Baby Pigs [videocassette]. University Park, PA: Pennsylvania State



University Ag; 1988; 1/2" VHS, 16 min. (available for loan from Penn State Audiovisual Services)

Keyword: Piglets, techniques, injection, sow handling.

Note: Demonstrates techniques used on newborn pigs including tooth clipping, tail docking, ear notching, ear tattooing, intramuscular and subcutaneous injections, and castration. Sow injections and handling in the farrowing house are covered as well.

Proper Pig Handling for Markets & Packers [videocassette]. Bowling Green, KY: Livestock Conservation Institute; 1997; 1/2" VHS

Keyword: Swine, handling, livestock markets, packing plants, loading.

Note: This video demonstrates how to handle pigs at livestock markets and at the packing plant in order to increase pork quality. Provides information on product consistency, understanding and concern for animals, stress reduction, flight zone, range of vision, point of balance, handling equipment maintenance, loading and unloading, lighting, handling stressed pigs, and handling prior to stunning. The video is bilingual (English and Spanish).

NAL call number: Videocassette No. 2673.

Restraining/Injecting [videocassette]. Owatonna, MN: PigWorld; 199-?, 1/2" VHS, 20 min.

Keyword: Pigs, techniques, injection, restraint, snares.

Note: Demonstrates injection sites and techniques for pigs of all ages and describes use of various types of snares.

NAL call number: Videocassette No. 2600.

Surgical Procedures on Swine [videocassette]. Manchester, NH: Group Five Communications; 1989; 1/2" VHS, 36 min.

Keyword: Swine surgery, blood sampling, neck region and medial thigh.

Note: Topics covered include blood sampling, preanesthetic administration, and surgical approaches to the trachea, carotid sheath, external jugular vein, and the vessels of the medial thigh. This video was also produced by Charles River Laboratories.

NAL Call No.: Videocassette No. 1612.

Swine Handling and Transportation [videocassette]. Madison, WI: Livestock Conservation Institute; 1989?; 1/2" VHS, 21 min.

Keyword: Swine, handling transport, behavior.

Note: Dr. Temple Grandin describes basic principles of pig behavior including vision, flight zone, reaction to noise, and following behavior. Shows various handling and transportation practices that reduce bruises, decrease injuries, and increase efficiency.

NAL call number: Videocassette No. 1593.

Swine Handling for Pork Producers [videocassette]. Des Moines, IA: National Pork Producers Council; Pork Quality Assurance Video Series - #3; 1996; 1/2" VHS, 15 min. Includes a manual and quiz.

Keyword: Swine, handling, behavior, loading, meat quality, facility design.

Note: Describes the effect of proper handling on meat quality, methods of handling based on pig behavior and human contact, facility design, and loading for transport.

NAL call number: Videocassette No. 2332.

Swine Handling for Transporters [videocassette]. Des Moines, IA: National Pork Producers Council; Pork Quality Assurance Video Series - #4; 1996; 1/2" VHS, 17 min. Includes manual, guide, quiz, and laminated adverse weather chart.

Keyword: Swine, handling, meat quality, loading, transport, weather.

Note: Covers effect of proper handling during loading and transport on meat quality.

Provides transport guidelines for adverse weather conditions.

NAL call number: Videocassette No. 2333.

Swine Health Care [filmstrip]. San Luis Obispo, CA: Vocational Educational Productions; 1981; audio cassette, guide.

Keyword: Management, care, husbandry, diseases.

Note: This program discusses the importance of prevention in combating diseases and parasites of swine, and gives an overview of common diseases and parasites of swine. Recommended practices for prevention and/or treatment are also covered.

NAL call number: Filmstrip No. 209.

Swine Management Practices I [videocassette]. Lubbock, TX: Creatice Educational Video; 1995; 1/2" VHS, 18 min.

Keyword: Swine, management, housing, farrowing.

Note: Covers swine characteristics, housing, management of sows and piglets during farrowing. Includes a summary, quizzes, and answers.

NAL call number: Videocassette No. 2578.

Swine Management Practices II [videocassette]. Lubbock, TX: Creative Educational Video; 1995; 1/2" VHS, 19 min.

Keyword: Swine, management, techniques.

Note: Covers techniques for processing baby pigs including tooth clipping, tail docking, iron injections, ear notching, and castration. Also discusses weaning, feeding/finishing, and paint branding. Includes summary, quizzes, and answers.

NAL call number: Videocassette No. 2579.

Swine Respiratory Disease [videocassette]. Ames, IA: Iowa State University Cooperative Extension Service in cooperation with WOI-TV. Distributed by RMI Media Productions, Shawnee Mission, KS; 1986; 1/2" VHS, 120 min.

Keyword: Swine diseases, pneumonia.

Note: This is a set of four videos on swine respiratory disease. It was originally broadcast on Iowa Public Television Network between February 3-24, 1986. Part 1 is an introduction to swine pneumonia. Part 2 addresses atrophic rhinitis. Part 3 is a description of various bacterial pneumonia. Part 4 discusses mycoplasma viruses.

NAL call number: Videocassette No. 1422.



Working Safely with Swine [slide presentation]. West Lafayette, IN: Purdue University Audiovisual Productions; 1980; 8 min., 55 slides and 1 audiocassette.

Keyword: Swine, handling, safety.

Note: Points out potential hazards in handling swine and how to avoid them.

# Internet Resources

An effort has been made to cite sources in a consistent style and to ensure accurate Uniform Resource Locator (URL) addresses. However, given the variable nature of information available on the Internet, citations may vary in their format, and URL addresses may be subject to change.

## Individuals and Organizations

### **Dr. Temple Grandin**

<http://grandin.com>

Accessed September 17, 1998

An extremely relevant and useful site developed by Temple Grandin, Ph.D., an expert in livestock behavior, design of animal handling facilities, and humane slaughter. Includes extensive information on livestock behavior, humane slaughter, recommended handling and stunning practices, design of facilities, ritual slaughter, stress and meat quality, a survey of stunning and handling in federally inspected slaughter plants, and abstracts of over 30 articles by Dr. Grandin.

### **Animal Welfare Information Center**

<http://www.nal.usda.gov/awic/awic.htm>

Accessed September 17, 1998

Provides bibliographies and information resource publications on livestock handling and transportation, as well as several newsletter articles on transport and welfare of agricultural animals. Links to the collections of the National Agricultural Library, which can be searched on-line.

### **Swine Care Handbook**

<http://www.nppc.org/PROD/swinecarehandbook.html>

Accessed September 17, 1998

A publication of the National Pork Producers Council available on-line. Includes sections on handling, transport, and the NPPC position on handling of sick and injured pigs.



## **Livestock Conservation Institute**

<http://www.lcionline.org>

Accessed September 17, 1998

A source for several educational videos focusing on animal handling in production facilities. Pamphlets on handling, transport, and non-ambulatory animals are also available here.

## **Farm Sanctuary**

<http://www.farmsanctuary.org/careinfo/index.htm>

Accessed September 17, 1998

Provides information on humane handling of farm animal species including cattle, chickens, turkeys, pigs, sheep, rabbits, ducks, geese, and goats. Mostly applicable to those caring for a small number of animals. Video documentaries of poultry slaughter and the marketing of non-ambulatory livestock are available as well.

## **International Air Transport Association**

<http://www.iata.org/cargo/live.htm>

Accessed September 17, 1998

Contains information about transport of all types of animals by aircraft. Source for IATA Live Animals Regulations, published annually in October. Also provides information about training courses run by IATA for those handling live animals during the shipping process.

## **Tim Harris, Consultant**

<http://www.tim-harris.co.uk>

Accessed September 17, 1998

Source for ordering the Animal Transport Association's Manual for the Transport of Live Animals by Road (Tim Harris is the editor), which covers regulations and legislation pertaining to the transport of livestock worldwide. Mr. Harris is a consultant specializing in livestock transport issues.

## **University of California, Davis, Veterinary Medicine Extension**

<http://www.vetmed.ucdavis.edu/vetext/AN-Progs.html>

Accessed September 17, 1998

Provides series of on-line booklets dealing with agricultural animal care, including behavior, handling, and transport. Beef cattle, broiler chickens, dairy cattle, laying hens, sheep, swine, and turkeys are covered. An article on the transport of horses is available at this site as well.

## **National Agricultural Safety Database**

<http://www.cdc.gov/niosh/nasd/menus/topanim.html>

Accessed July 22, 1998

This site, set up by the Centers for Disease Control, provides the full text of many documents on safe handling of farm animals. Information about related videos is also available.

## **Electronic Pamphlets and Articles**

### **Cow Stress and Well-Being Publications**

<http://www.inform.umd.edu/EdRes/Topic/AgrEnv/ndd/cstress/>

Accessed September 17, 1998

Documents reviewed by National Dairy Database editors. Includes "Animal Handling Tips," "Cows Appearing Stressed - Is It Stray Voltage?," "How to Reduce Heat Stress in Dairy Cattle," "Livestock Handling Guide," and "Livestock Trucking Guide."

### **Getting Hogs to Market Safely**

<http://www.ianr.unl.edu/pubs/swine/g616.htm>

Accessed September 21, 1998

Robert D. Fritschen, Extension Swine Specialist, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. Discusses the proper way to load and transport swine in order to prevent injuries and death.

### **An Investigation into the Relationship Between Livestock Distribution Channels and Transport Stress**

<http://141.163.121.36/Research/RuralDev/MeatDist/changes.html>

Accessed September 17, 1998

Dr. Sharon Cullinane, Meat Research, University of Plymouth. A short introduction to an on-going research project investigating the effect of changing methods of marketing cattle on livestock well-being.

### **Livestock Handler's Safety**

<http://www.colostate.edu/Depts/CoopExt/PUBS/LIVESTK/publive.html>



Accessed September 17, 1998

Mac Legault, Ann Swinker, and Temple Grandin, Colorado State University. Discusses livestock handling and transport in the context of avoiding injuries to human handlers. Applies principles of animal behavior to handling practices and facility design.

### **Livestock Injured in Transport Accidents**

<http://www.agric.nsw.gov.au/Aw/Pamphlet/pamp8.htm>

Accessed September 17, 1998

Animal Welfare Unit, New South Wales Agriculture. Instructions for livestock transporters on how to humanely handle animals injured in transport vehicle accidents.

### **Physiology, Balance, and Management of Horses During Transportation**

[http://www.vetmed.ucdavis.edu/vetext/INF-AN\\_HorsTranspt.html](http://www.vetmed.ucdavis.edu/vetext/INF-AN_HorsTranspt.html)

Accessed September 21, 1998

Carolyn L. Stull, Ph.D., Extension Specialist, Animal Welfare Program, School of Veterinary Medicine, University of California, Davis. A paper presented at the 1997 Horse Breeders and Owners Conference. Provides a detailed look at the causes of stress experienced by horses during transport, the effects of that stress, and how to properly transport horses to minimize stress and injuries.

### **Recommended Animal Handling Guidelines for Meatpackers**

<http://www.meatami.org>

Accessed September 21, 1998

Temple Grandin, Ph.D., for the American Meat Institute. An extensive publication covering handling of livestock during the slaughter process. Detailed discussion of livestock behavior and how to apply it to handling, stunning practices, and handling of non-ambulatory livestock.

### **Transporting Poultry in a Humane Manner**

<http://www.ext.vt.edu/pubs/poultry/factsheets/6.html>

Accessed September 17, 1998

Phillip J. Clauer, Poultry Extension Specialist, Virginia Cooperative Extension. A factsheet which provides recommendations for the safe transport of poultry. Mainly directed at small flock owners, but applicable to transport of large numbers of birds.

# Organizations

## Agriculture and AgriFood Canada

Sir John Carling Building  
930 Carling Avenue  
Ottawa, Ontario  
K1A 0C7 Canada

TELEPHONE: (800) 410-7104; in Ottawa (613) 759-7959

WORLD WIDE WEB: <http://www.agr.ca> or [aceis.agr.ca/newintre.html](http://aceis.agr.ca/newintre.html)

RESOURCES/SERVICES: ACEIS, Agri-Food Canada's electronic information service, provides list of available brochures and codes of practice for care and handling of livestock and poultry. Public information request service can be reached at (613) 759-1000 or by email at [pirs@em.agr.ca](mailto:pirs@em.agr.ca). Website provides links to provincial AAFC websites.

## American Meat Institute

P.O. Box 3556  
Washington, DC 20007, USA

TELEPHONE: (703) 841-2400

FAX: (703) 527-0938

WORLD WIDE WEB: <http://www.meatami.org>

RESOURCES/SERVICES: Publishes resource materials for the meat industry including videos, handbooks, *Recommended Animal Handling Guidelines for Meat Packers*, and *Good Management Practices for Animal Handling and Stunning*.

## Animal Transportation Association (ATA)

P.O. Box 251 Redhill  
Surrey RH1 5FU  
England

TELEPHONE: 44 (01737) 822249

FAX: 44 (01737) 822954

EMAIL: [100257.1720@compuserv.com](mailto:100257.1720@compuserv.com)

RESOURCES/SERVICES: Publishes the *ATA Manual for the Transportation of Live Animals by Road* -- particularly applicable to those moving animals into and out of the EU countries. Includes government regulations; inspection posts; animal behavior; animal handling; container,



space, documentation, and vehicle requirements; CITES information; and transport guidelines by species. Also publishes a quarterly newsletter.

### **Animal Welfare Information Center**

Agricultural Research Service  
National Agricultural Library  
10301 Baltimore Ave.

Beltsville, MD 20705-2351, USA

TELEPHONE: (301) 504-6212

FAX: (301) 504-7125

EMAIL: [awic@nal.usda.gov](mailto:awic@nal.usda.gov)

WORLD WIDE WEB: <http://www.nal.usda.gov/awic/awic.htm>

RESOURCES/SERVICES: Vast collection of serials, monographs and audiovisuals within the National Agricultural Library (NAL). Documents may be borrowed through an interlibrary loan. For more information on document delivery, contact (301) 504-5755. The Center performs brief complimentary searches of AGRICOLA and other relevant databases. The Center produces several bibliographies on livestock and poultry handling, transport and welfare.

### **Grandin Livestock Handling Systems, Inc.**

2918 Silver Plume Dr., Unit C3  
Fort Collins, CO 80526, USA

TELEPHONE: (970) 229-0703

EMAIL: [grandin@lamar.colostate.edu](mailto:grandin@lamar.colostate.edu)

WORLD WIDE WEB: <http://grandin.com>

RESOURCES/SERVICES: Website with extensive collection of full-text articles on livestock handling, transport, slaughter methods, design of facilities, livestock behavior and stress and meat quality, as well as surveys of handling practices at packing plants and markets. Consults with the livestock industry on facility design, livestock handling, and animal welfare.

### **Humane Slaughter Association**

34 Blanche Ln.  
South Mimms, Potters Bar, Herts EN6 3PA  
United Kingdom

TELEPHONE: 01-707-659040

FAX: 01-707-649279

RESOURCES/SERVICES: Provides information on slaughter methods and handling of livestock at abattoirs.

## **International Air Transport Association**

2000 Peel Street  
Montreal, Quebec  
Canada H3A 2R4

WORLD WIDE WEB: <http://www.iata.org/cargo/live.htm>

RESOURCES/SERVICES: Publishes *IATA Live Animals Regulations*, the international standard for transporting live animals by air. A new edition appears annually. Runs training courses for live animal cargo handlers.

## **National Broiler Council**

1015 15<sup>th</sup> St., NW, Suite 930  
Washington, DC 20005-2605, USA

TELEPHONE: (202) 296-2622

FAX: (202) 293-4005

WORLD WIDE WEB: <http://www.eatchicken.com> or <http://www.ainet.com/cpif/nbc.htm>

RESOURCES/SERVICES: Provides information and research to member companies on an individual basis. As of September 1998, NBC is in the process of finalizing animal care and well-being guidelines for the broiler industry.

## **Kondinin Group**

P.O. Box 913  
Cloverdale, WA, 6105 Australia

TELEPHONE: (08) 9478 3343

FAX: (08) 9478 3353

RESOURCES/SERVICES: Source of Australian information on handling. Produced a manual on cattle-handling equipment entitled *Handling the Herd*. Produces serials and manuals based on surveys of the needs of Australian farmers.

## **Livestock Conservation Institute**

1910 Lyda Dr.  
Bowling Green, KY 42104-5809, USA

TELEPHONE: (502) 782-9798

FAX: (502) 782-0188

WORLD WIDE WEB: <http://www.lcionline.org>

RESOURCES/SERVICES: Provides educational resources for livestock handlers, including a library of handling videos, brochures, and written guidelines.



## **Livestock Marketing Association**

7509 Tiffany Springs Parkway  
Kansas City, MO 64153, USA

TELEPHONE: 1 (800) 821-2048

FAX: (816) 891-7926

RESOURCES/SERVICES: Provides educational information on livestock handling to auction markets, commission firms, dealers, order buyers, and related businesses. Materials include a code of handling practices, a laminated poster entitled "Recommended Livestock Handling Practices for Livestock Markets," and a video. LMA also distributes information about training programs to its members.

## **Ministry of Agriculture, Fisheries, and Food**

Animal Welfare Division,  
Branch D, Government Buildings,  
Hook Rise South, Tolwaorth,  
Surbiton, Surrey KT6 7NF  
England

WORLD WIDE WEB: [www.maff.gov.uk](http://www.maff.gov.uk)

RESOURCES/SERVICES: Provides guidance on new laws pertaining to livestock handling. Publishes guidelines on handling of all species of livestock and poultry. MAFF/IB International Report 1998 (available on website) has a chapter on policies covering farm animal welfare on the farm, in transit, at market, and at slaughter.

## **National Pork Producers Council**

Mailing address: P.O. Box 10383  
Des Moines, IA 50306, USA  
Street address: 1776 NW 114th St.  
Clive, IA 50325, USA

TELEPHONE: (515) 223-2600

FAX: (515) 223-2646

WORLD WIDE WEB: <http://www.nppc.org>

RESOURCES/SERVICES: Has website with section on educational materials for producers, including handling videos and a CD-ROM. A catalog of materials can be ordered from above mailing address. Also conducts training conferences for swine producers.

**United States Department of Agriculture  
Agricultural Marketing Service**

Transportation and Marketing Division

P.O. Box 96456

Washington, DC 20250, USA

CONTACT: Thomas M. Poerstel, Marketing Specialist

TELEPHONE: (202) 690 -1323

FAX: (202) 690-1340

CONTACT: William L. Craig, Jr., Agricultural Marketing Specialist

TELEPHONE: (202) 720-8272

FAX: (202) 690-1340

WORLD WIDE WEB: <http://www.ams.usda.gov/tmd/>

RESOURCES/SERVICES: Published *A Guide for Livestock Exporters* -- guidelines for exporting livestock and poultry (includes handling, space requirements, health, safety, feeding and watering, reducing stress prior to shipment, drugs and equipment needed for journey), comparison of types of transport, list of carriers and services, addresses of livestock export inspection facilities, and insurance. Also provides technical services and research on transportation problems for livestock exporters as well as information on transport equipment, recommended handling methods, carrier services and livestock export tip sheets.

**United States Department of Agriculture  
Animal and Plant Health Inspection Service**

Import-Export Operations Staff

Room 765 - Federal Center Building

6505 Belcrest Rd.

Hyattsville, MD 20782, USA

TELEPHONE: (301) 436-8383

WORLD WIDE WEB: <http://aphisweb.aphis.usda.gov>

RESOURCES/SERVICES: Provides specific information on health and test requirements for export livestock. Publishes an annual list of registered animal carriers.





# Guidelines

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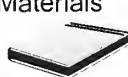
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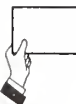
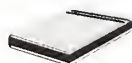
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